

Pulse Hot Strip (PHS) Method: Uncertainty Assessment

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The pulse hot strip (PHS) method is a newly developed dynamic method to simultaneously measure the thermal conductivity and thermal diffusivity. It is based on monitoring the temperature response of a solid or fluid sample to a very short heat pulse liberated by a strip heat source. A purpose-built new sensor integrates the strip heat source and two thermometers at different mutual distances on one foil. Even some seconds after initiating the experiment both thermal transport properties mentioned are determined. The new method is cheap, versatile and very accurate. In this study, the combined standard uncertainty of the method is determined as closely as possible with the principles of the ISO Guide to the Expression of Uncertainty in Measurement. On the basis of the PHS working equation the major sources of errors are analysed, namely the ideal model errors, the evaluation errors, and the measurement errors. The uncertainty is found to be 3 % for both transport properties mentioned.